NOAA Backgrounder

NOAA Locates Wreckage On Ocean Floor After TWA Flight 800 Disaster

When TWA Flight 800 crashed into the Atlantic Ocean off Long Island, N.Y., in July 1996, it was a NOAA hydrographic survey vessel that scanned the ocean floor and found the primary wreckage fields of the aircraft, enabling Navy divers to recover crash victims and the flight recorders as quickly as possible.

The survey ship was the RUDE, one of NOAA's fleet of 15 highly specialized ships that have the unique capabilities and equipment needed by the agency to do nautical charting and conduct environmental research. The RUDE was under the command of Commander Sam De Bow of the NOAA Corps, the nation's smallest uniformed service. NOAA Corps officers, who hold science or engineering degrees, are highly skilled at operating and managing the ships as well as supporting the scientific research conducted on board. Many, like Cmdr. De Bow, are also expert hydrographers.

Not only can NOAA redirect its ships as necessary during times of national crisis, NOAA Corps officers have the flexibility and mobility to respond immediately to such crisis situations. In the aftermath of the TWA crash, a NOAA team led by Cmdr. Nick Perugini set up hydrographic support operations at the onshore site at East Moriches, Long Island, joining forces with the RUDE's officers and civilian crew to turn the ship's sonar data into sophisticated maps and charts. These charts precisely pinpointed submerged debris hidden under the miles of watery expanse.

RUDE's Response

On the evening of July 17, the RUDE was anchored off Pt. Judith, R.I., waiting to begin a new charting project in the commercial shipping lanes that connect New York to Boston. The ship had just completed a detailed hydrographic survey in the approaches to New York Harbor.

Cmdr. De Bow learned of the crash of TWA Flight 800 while listening to the marine radio, and immediately notified the Coast Guard that he was available to render assistance. After steaming all night, the ship arrived at the crash site at 7 a.m. the following morning and began searching for victims and surface debris.

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A WORD ABOUT NOAA. . .

The National Oceanic and Atmospheric Administration (NOAA) conducts research and gathers data about the global oceans, atmosphere, space, and sun, and applies this knowledge to science and service that touch the lives of all Americans.

NOAA warns of dangerous weather, charts our seas and skies, guides our use and protection of ocean and coastal resources, and conducts research to improve our understanding and stewardship of the environment which sustains us all.

A Commerce Department agency, NOAA provides these services through five major organizations: the National Weather Service, the National Ocean Service, the National Marine Fisheries Service, the National Environmental Satellite, Data and Information Service, and Office of Oceanic and Atmospheric Research; and numerous special program units. In addition, NOAA research and operational activities are supported by the Nation's seventh uniformed service, the NOAA Corps, a commissioned officer corps of men and women who operate NOAA ships and aircraft, and serve in scientific and administrative posts.

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Within 24 hours of the crash, the RUDE had conducted underwater surveys and located the major debris field, and within 48 hours had the area mapped. Sonar information was immediately furnished to the National Transportation Safety Board and the U.S. Navy. Five days after the crash, the Navy began diving on sonar contacts furnished by the RUDE. NOAA's rapid response to this tragedy played a key role in facilitating victim recovery.

For its surveys, the RUDE employed state-of-the-art hydrographic instrumentation to locate the wreckage quickly and position it accurately. By using the Differential Global Positioning System, RUDE was able to establish its position to an accuracy of three to five meters. A side-scan sonar towed by the ship created an image of the bottom along the towfish track. Any object that was "hard" or reflective appeared on the sonar record.

In addition to the side-scan sonar, RUDE utilized a shallow water multibeam sonar. This system measures the depth over a feature very precisely. From these data, a three dimensional image was constructed to help visualize various pieces of seafloor debris.

NOAA's Shore Team

To ensure maximum processing interpretation of the RUDE data, NOAA established a five-person team, most of whom were commissioned officers, to work with the Navy and NTSB. The team members, all highly skilled in sonar interpretation and chart making, had two principal objectives: first, to provide the exact location of debris to the Navy divers; second, to assimilate all debris data onto a Geographic Information System grid for planning and display purposes. Much of the debris was scattered over a two square mile area. As divers had only 15 minutes of bottom time at depths of 120 feet, it was imperative that the positions of these sonar contacts be accurate and that divers have an idea of the dimensions of the wreckage they were searching for. The NOAA-identified debris locations were proven accurate throughout the dive operations.

Early in the investigation, the NTSB and other agencies needed analytical tools to help map out possible crash scenarios. The NOAA team assimilated radar data showing the last "hits" recorded on TWA Flight 800 and integrated this information with positions of sonar contacts located by RUDE. The data were displayed on the backdrop of a nautical chart. This presentation became a powerful tool for investigators to begin their analyses. After seeing the quality of the NOAA product, NTSB Vice Chairman Robert Francis and Navy RAdm. Robert Kristensen requested that NOAA provide them with customized charts for their daily televised news briefings.

HAZMAT's Trajectory Analysis

NOAA's Hazardous Materials Response and Assessment Division in Seattle, Wash., used its Trajectory Analysis Techniques program to provide trajectory analysis that aided the Coast Guard, Suffolk County Police, New York City Police and other agencies in their searches for floating surface debris. NOAA HAZMAT has been using this analytical approach in oil spill response for several years, and found it extremely useful for oil spill response and planning exercises after the TWA crash.

NOAA's Weather Predictions

NOAA's National Weather Service provided searchers with accurate local forecasts, and search and salvage vessels with tailored weather forecasts. This proved especially valuable when severe weather was approaching. Also aiding the search and recovery operations were wind and sea state predictions.

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